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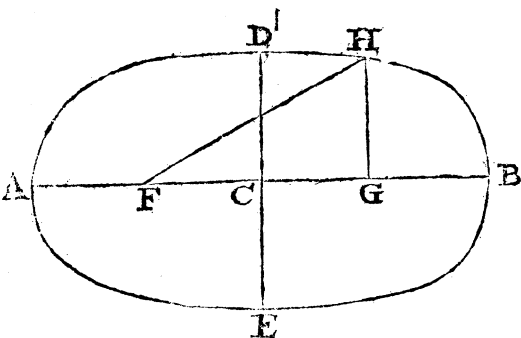
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I. De Orbita *Cassiniana*. By Dr Gregory.

**E**X quo Celeberrimus *Dom. Cassini*, in *Tractatu de Origine & Progressu Astronomiæ*, Curvam quandam pro Planetæ Orbita Astronomis proposuit, & de ipsius Curvæ natura, & de Gravitatis lege ad eam percurrendam requisita, varie multumque ab eruditis disputatum est. Mihi etiam de eadem denuo cogitanti cum diversæ ejus species, tum & harum proprietates aliquæ nondum satis perspectæ occurrebant. Has breviter contexere, & cum ijs publice communicare volui, quibus hujusmodi contemplationes non injucundæ videbuntur.

Satis notum est istius Orbitæ hanc esse naturam. Si a datis duobus punctis F & G ad quodvis curvæ punctum H ducantur rectæ FH, GH; rectangulum sub FH, GH æquale est dato spatio. Recta FG hinc inde producta denec curvæ occurrat, ostendit Vertices A & B; & AB est Axis principalis; mediumque inter vertices punctum C est figuræ Centrum; & DE, per Cad A B normalis, Axis minor; punctaque F & G Foci.



In hac figura si axis minor excedat distantiam focorum, Curva figuram terminans est ubique versùs centrum cava, qualis vulgo habetur. Si, manente axe principali, distantia focorum minuat, augebitur axis minor, qui tamen minor manet axe Ellipsis eodem axe principali, indèmq; focis descriptæ; donec tandem, coeuntibus focus, ille evadat æqualis axi majori, & figura abeat in Circulum. Si vero, e contra, distantia focorum augeatur; minuetur axis minor, fietque æqualis dictæ distantia, cum hæc est ad axem principalem sicut unitas ad medium proportionalem inter unitatem & ternarium. Si



sunt etiam in ijs casibus, ubi in se redit orbitamque perficit, quædam ejus excentricitates ita amplæ, ut curva prope D & E (Fig. 2.) versus Solem convexa evadat; adeoque vi a Sole centrifugâ Planetæ opus esset, ut hanc Orbitæ suæ partem percurreret, dum interim in locis propioribus & remotioribus B & A vis ad Solem centripeta requiritur. Id est corpora circumsolaria eâ lege moveri posse concedendum esset, ut in paribus a Sole intervallis hic vis centripeta, illic centrifuga obtineret, quod quam sit a naturæ legibus alienum facile omnes perspicient. Et licet nullius e Planetis tanta sit excentricitas, cum tamen Geometris notum sit figuræ, cujus species omnes ultra certum terminum munerî cuivis naturæ obeundo ineptæ fuerint, ejus species reliquas citra dictum terminum, quasi eidem munerî idoneas, admitti non posse: Neceesse est *Curvam hanc Cassinianam ex Astronomia rejicere*, non solum ob rationes Prop. VIII. Lib. III. Elem. Astr. adductas, nempe *quod neque observatis cælestibus congruat propter minoris axis brevitatem, neque rationes Physicæ respondeant, cum ad illam describendam opus esset vi centripetâ ad Solem abhorrente ab illa per rerum naturam usurpata, sed etiam propter absolutam impossibilitatem*. Impossibile namque est hujus figuræ speciem quamcunque posse a Planeta percurri, ita ut anguli ad focum a Sole diversum proportionales sint temporibus; sic enim area per radium vectorem descripta non esset temporî proportionalis. Non enim aucto angulo ad focum unum aequalibus incrementis, areæ ad alterum incrementa simul facta etiam æqualia sunt, uti perperam nuper sentiebam.

In duobus ultimis schematibus maxima figuræ latitudo invenitur si centro C per focos describatur circulus; seceabit namque hic Curvam in punctis L, L quæsitis. Estque maxima ordinata KL tertia proportionalis rectis GF & FD in horum primo, vel quarta proportionalis ipsi GF, GA, & AF in utroque.

Superflite DE, ordinata ex foco FP æqualis est semi-axi minori CD, quando axis minor est ad distantiam focorum ut latus quadrati ad diametrum. Si distantia focorum fuerit major quam pro hac ratione, FP excedet CD.

II. Georg.